1. The art rejections over Chapman in view of Donomoto have been withdrawn in view of the present response. Chapman teaches the skin in the formed of continuous fibers applied to the core by filament winding techniques. As such, the orientation of the fibers in the direction which is substantially parallel to the longitudinal channels would close up the open ends of the hollow tubes. That would defeat the objectives of Chapman.
2. The art rejections over Jones in view of Donomoto are maintained.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 2, 10, 11, 14, and 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al. (US 6,630,093) in view of Donomoto et al. (US 4,450,207). Jones teaches a composite material for use in aircraft structure comprising a metallic core material with a skin covering the core material (column 4, lines 55-56; column 6, lines 57-65). The core material comprises a micro multi-void core having two planar surfaces and including a plurality of continuous parallel, longitudinal channels, each extending in a direction parallel to the planar surfaces (figures 6 and 7). Jones discloses that the core with a solid internal structure is converted to the core with a non-solid internal structural pattern

(column 14, lines 60-65). The non-solid structure is composed of trusses arranged in a tensegrity pattern (column 15, lines 35-40). Likewise, the core would have no seams, no joins between the voids. Additionally, Jones discloses the freeform-fabricated cores are virtually seamless (column 17, lines 1-10). Jones teaches the skin material made from a ceramic fiber reinforcing metal matrix composite material (column 5, lines 5-25). Jones does not specifically disclose the ceramic fibers which are made from continuous alumina fibers. Donomoto, however, teaches a fiber reinforced metal composite material having been used widely in aircraft wherein the fiber reinforcing material includes carbon fibers, alumina fibers or a combination thereof (column 1, lines 1-5; column 4, lines 60-67). The alumina fibers are oriented substantially parallel to the longitudinal axis of the structure (column 12, lines 45-50). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use continuous alumina fibers as a fiber reinforcing material for the skin layer wherein the alumina fibers are oriented substantially parallel to the longitudinal axis of the structure motivated by the desire to obtain a skin layer with superior bending strength and fatigue strength.

Jones discloses that the internal geometry patterns can be varied as dependent upon the desired flexibility, stiffness and shear strength of the composite articles with potentially much greater strength to weight ratios. Jones discloses the composite material found useful in aerospace applications. Jones does not specifically disclose the width of the channels. Since the width of the

channels is recognized as a result-effective variable, differences in concentration will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such width is critical or provides unexpected results. Therefore, in the absence of unexpected results, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the core with tensegrity structure wherein the width of the channels is in the range instantly claimed motivated by the desire to provide a core with higher compressive reinforcement while maintaining much greater strength to weight ratios for aerospace applications. This is in line with *In re Aller*, 105 USPQ 233 which holds discovering the optimum or workable ranges involves only routine skill in the art.

Jones as modified by Donomoto does not teach the core comprises an extrusion. However, it is a product-by-process limitation not as yet shown to produce a patentably distinct article. It is the examiner's position that the article of Jones as modified by Donomoto is identical to or only slightly different than the claimed article prepared by the method of the claim, because both articles are formed from the same materials, having structural similarity. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or an obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a

different process. *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). The burden has been shifted to the applicant to show unobvious differences between the claimed product and the prior art product. *In re Marosi,* 218 USPQ 289,291 (Fed. Cir. 1983). It is noted that if the applicant intends to rely on Examples in the specification or in a submitted Declaration to show non-obviousness, the applicant should clearly state how the Examples of the present invention are commensurate in scope with the claims and how the Comparative Examples are commensurate in scope with Jones/Donomoto.

5. Claims 3, 8, 9, 12, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al. (US 6,630,093) in view of Donomoto et al. (US 4,450,207) as applied to claim 19, further in view of Gunnink (US 4,935,291). Jones does not specifically disclose the metal core formed from aluminum, copper or alloys of aluminum and copper. Gunnink, however, teaches a composite laminate for use as construction material of aircraft wings. The composite laminate comprises a metal core sandwiched between two composite skins. The core is an alloy of aluminum and copper (column 2, lines 35-40). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a core material formed from an alloy of aluminum and copper motivated by the desire to provide the core with sufficient tensile strength for use in aircraft wings.
6. The art rejections based on Jones have been maintained for the following reasons. Applicant contends that Jones fails to teach or suggest the width of the

channel as well as the extruded tubular core. However, the examiner notes that Jones discloses that the internal geometry patterns can be varied as dependent upon the desired flexibility, stiffness and shear strength of the composite articles with potentially much greater strength to weight ratios. Jones discloses the composite material found useful in aerospace applications. Further, since the width of the channels is recognized as a result-effective variable, differences in concentration will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such width is critical or provides unexpected results. Therefore, in the absence of unexpected results, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the core with tensegrity structure wherein the width of the channels is in the range instantly claimed motivated by the desire to provide a core material with higher compressive reinforcement while maintaining much greater strength to weight ratios for aerospace applications. This is in line with *In re Aller*, 105 USPQ 233 which holds discovering the optimum or workable ranges involves only routine skill in the art.

While it is true that Jones as modified by Donomoto does not teach the core comprises an extrusion, it is a product-by-process limitation not as yet shown to produce a patentably distinct article. It is the examiner's position that the article of Jones as modified by Donomoto is identical to or only slightly different than the claimed article prepared by the method of the claim, because both articles are formed from the same materials, having structural similarity.

Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or an obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). The burden has been shifted to the applicant to show unobvious differences between the claimed product and the prior art product. *In re Marosi,* 218 USPQ 289,291 (Fed. Cir. 1983). It is noted that if the applicant intends to rely on Examples in the specification or in a submitted Declaration to show non-obviousness, the applicant should clearly state how the Examples of the present invention are commensurate in scope with the claims and how the Comparative Examples are commensurate in scope with Jones/Donomoto.

Jones teaches a composite material for use in aircraft structure comprising a metallic core material with a skin covering the core material (column 4, lines 55-56; column 6, lines 57-65). Jones teaches the skin material made from a ceramic fiber reinforcing metal matrix composite material (column 5, lines 5-25). Jones does not specifically disclose the ceramic fibers which are made from continuous alumina fibers. Donomoto, however, teaches a fiber reinforced metal composite material having been used widely in aircraft wherein the fiber reinforcing material includes carbon fibers, alumina fibers or a combination thereof (column 1, lines 1-5; column 4, lines 60-67). The alumina fibers are

oriented substantially parallel to the longitudinal axis of the structure (column 12, lines 45-50). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use continuous alumina fibers as a fiber reinforcing material for the skin layer wherein the alumina fibers are substantially oriented parallel to the longitudinal axis of the structure motivated by the desire to obtain a skin layer with superior bending strength and fatigue strength. Accordingly, the combined teachings of the applied references teach substantially all of the continuous aluminum oxide fibers which are oriented substantially parallel to the longitudinal channels. Applicant's reiterated positions taken with respect to the other rejections, the examiner's comments set forth above are equally pertinent in the support of the rejections as well.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will

the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai Vo whose telephone number is (571) 272-1485. The examiner can normally be reached on Monday through Thursday, from 9:00 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on (571) 272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Hai Vo/
Primary Examiner, Art Unit 1787